



**U.S. Department of Energy
Technical Qualification Program**

Emergency Management Topical Area

Study Guide

<p>Section 1.0 General Technical</p>

May 1996



Competency 1.1 Emergency management personnel shall demonstrate a familiarity level knowledge of the relationship of other disciplines to the emergency management function and the ability to work with personnel in these other disciplines.

1. Supporting Knowledge and Skills

- a. Explain the roles and responsibilities of each of the following disciplines to emergency management:
- Health Physics
 - Environmental Transport & Diffusion (air and water)
 - Industrial Hygiene
 - Chemistry
 - Biology
 - Worker and Public Health & Safety
 - Hazardous Materials (storage, handling, & transport)
 - Criticality Safety
 - Explosives Safety
 - Environmental Protection
 - Detection & Monitoring (radiological and non-radiological)
 - Consequence Assessment (models & codes)
 - Protective Measures (personnel protective equipment, sheltering, decontamination, evacuation, & relocation)
 - Fire Protection/Fire Suppression Operations
 - Operations & Maintenance
 - Security
 - Medical
 - Public Affairs
 - Legal



2. Self-Study Activities (corresponding to the intent of the above competency)

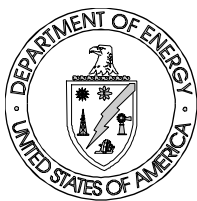
NOTE: • Below are two web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://cted.inel.gov/cted/index.html	DOE Standards, Guides, and Orders.
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Scan the DOE Emergency Management Guides on consequence assessment, medical, public affairs, and hazards assessment.

Review the table on the following pages.

The Basic Relationship of Several Disciplines to Emergency Management	
Discipline	Provides information on:
Health physics	health effects and health consequences of radiation exposure
Environmental transport and diffusion	the movement of materials through the environment (air and water) and the dilution or concentration of these materials
Industrial hygiene	health effects due to worker exposure to hazardous materials and control of this exposure
Chemistry	characteristics and behavior of chemicals and composition of hazardous materials
Biology	effects of hazardous materials/environments on living organisms and the environment; how hazardous materials behave in living systems
Worker and public health and safety	the protection of worker and public health
Hazardous materials	radiological and nonradiological materials that, when released, can cause harm to life, property, or the environment



The Basic Relationship of Several Disciplines to Emergency Management	
Discipline	Provides information on:
Criticality safety	radiological processes and controls
Explosives safety	explosive hazards and precautions needed for handling and transport
Environmental protection	the prevention of environmental contamination by hazardous materials release
Detection and monitoring	monitors, alarms, and instrumentation available for detection of hazardous materials
Consequence assessment	likely targets of hazardous materials releases and the pathways and concentrations of these materials as they move in the environment through the use of computer- generated models
Protective measures	measures to be taken to protect worker and public health and safety from exposure to a hazardous materials release; includes sheltering, evacuation, relocation, or decontamination
Fire protection/fire suppression operations	understanding of the protective measures and building measures and equipment for response to a fire threat
Operations and maintenance	understanding of process works and maintenance necessary to identify potential hazards and dangers to worker and public health and safety
Security	building/facility/site control and access and safeguards and security issues
Medical	treatment of injured workers or the public
Public affairs	emergency information for the public; public affairs oversees the emergency public information program
Legal	liabilities and responsibilities related to emergency management



- EXERCISE 1.1-A Define the term “hazardous materials.”
- EXERCISE 1.1-B Explain the following emergency management concepts:
- Environmental transport and diffusion
 - Detection and monitoring
 - Consequence assessment
 - Protective measures
- EXERCISE 1.1-C Describe how knowledge of each of the following is essential to an effective emergency response:
- Fire protection/fire suppression operations
 - Operations and maintenance
- EXERCISE 1.1-D Explain the role of each of the following in an emergency management program:
- Security
 - Medical
 - Public affairs
 - Legal

3. Summary

Emergency management provides protection to worker and public health through an understanding of hazards and their effects on living organisms and the environment. Effective emergency management requires an understanding and integration of several different disciplines. For example, hazards assessments and consequence assessments provide information on the characteristics of hazardous materials and their behavior and transport in the environment. An understanding of the characteristics of hazards (chemistry of hazardous materials, criticality safety, and explosives safety) provides information on the control and detection of and protection from, the hazards. Health physics and industrial hygiene provide information on the biological effects of the hazards on human health, and environmental studies provide an understanding of the impact of the hazards on the environment.

4. Exercise Solutions

- EXERCISE 1.1-A Define the term “hazardous materials.”
- ANSWER 1.1-A Hazardous materials are radiological and nonradiological materials that, when released, can cause harm to life, property, or the environment.



EXERCISE 1.1-B Explain the following emergency management concepts:

- Environmental transport and diffusion
- Detection and monitoring
- Consequence assessment
- Protective measures

ANSWER 1.1-B

Emergency Management Concepts	
Emergency Management Term	Explanation
Environmental transport and diffusion	Once a hazardous material is released into the environment it will be moved through the environment according to meteorological conditions and the characteristics of the hazard itself.
Detection and monitoring	Monitors can detect the presence/absence of a specific hazard and may in some cases provide a measurement of the concentration of the hazard.
Consequence assessment	This methodology tracks the hazard through the environment using computer-generated models that incorporate the characteristics of the hazard, method of release, meteorological conditions, and topography to predict the direction and concentration of the hazard as it moves through the environment.
Protective measures	These steps are taken by workers and the public to avoid exposure to a hazard as it moves through the environment.

EXERCISE 1.1-C Explain how knowledge of each of the following is essential to an effective emergency response:

- Fire protection/fire suppression operations
- Operations and maintenance

ANSWER 1.1-C Fire protection and fire suppression operations provide information useful in planning for and responding to a facility/building fire emergency.



An overall understanding of the operations and maintenance of a facility assists in the identification of hazards and the potential for hazardous releases. Knowledge of operations can also provide insight into administrative controls that can be used to reduce/minimize hazards on site.

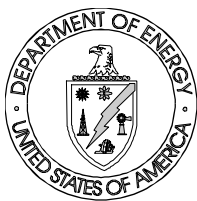
- EXERCISE 1.1-D Explain the role of each of the following in an emergency management program:
- Security
 - Medical
 - Public affairs
 - Legal

ANSWER 1.1-D Security/law enforcement is responsible for controlling facility/site access during an emergency event, as well as responding to safeguards and security issues related to the emergency event.

The medical organization provides immediate treatment or transport to a medical facility for personnel injured as the result of an emergency.

The public affairs department ensures that emergency information is provided to employees and the public. The public affairs department is also responsible for briefing the media and for coordination and/or oversight of emergency public information activities.

The legal component of the contractor organization oversees liability issues of emergency management activities and the emergency management program.



Competency 1.2 Emergency management personnel shall demonstrate a working level knowledge of hazardous material safety to oversee emergency activities and to provide guidance in mitigating emergencies.

1. Supporting Knowledge and Skills

- a. Discuss the concerns associated with the use of hazardous materials.
- b. Discuss the general safety precautions necessary for the handling, storage, and disposal of hazardous materials, to include explosive, flammable and combustible substances.
- c. Describe the types, uses, and limitations of chemical detection and monitoring equipment.
- d. Discuss the emergency procedures associated with accidental releases of hazardous materials to the environment, including: notifications, protective equipment, decontamination activities, and emergency rescue and treatment.

2. Self-Study Activities (corresponding to the intent of the above competency)

NOTE: • Below are two web sites containing many of the references you may need.

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Read 29 *Code of Federal Regulations* (CFR) 1910.120, “Hazardous Waste Operations and Emergency Response,” (a) Scope, Application, and Definitions.

EXERCISE 1.2-A What is the major concern associated with the use of hazardous materials?



Read 29 CFR 1910.119, (d) “Process Safety Information.”

EXERCISE 1.2-B Prior to conducting a hazard analysis, the employer must compile the written process safety information. Why?

Read National Fire Protection Association (NFPA) 471, “Recommended Practice for Responding to Hazardous Materials Incidents,” Section 4-5, Monitoring Equipment, pages 471-7 and -8.

EXERCISE 1.2-C List five examples of monitoring equipment that might be used for a hazardous materials response.

Read the DOE Emergency Management Guide *Interim Guidance for Protective Actions*, Section C, Guidance, pages 4 through 15.

Read the DOE Emergency Management Guide *Interim Guidance for Emergency Medical Support*, Section D through H, pages 3 and 4.

EXERCISE 1.2-D Where should decontamination be carried out, if possible?

EXERCISE 1.2-E What are the primary responsibilities of the rescue team?

3. Summary

Operations involving hazardous materials are of major concern both within DOE and outside the Department. Employee communication concerning the presence of hazardous materials and the safety precautions to be followed around the materials is of utmost importance. This is followed by the existence of an emergency response and preparedness plan and training/drills/exercises in the emergencies that might occur.

4. Exercise Solutions

EXERCISE 1.2-A What is the **major** concern associated with the use of hazardous materials?

ANSWER 1.2-A The safety and health risks to the employee.



EXERCISE 1.2-B Prior to conducting a hazard analysis, the employer must compile the written process safety information. Why?

ANSWER 1.2-B To enable the employer and employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals.

EXERCISE 1.2-C List five examples of monitoring equipment that might be used for a hazardous materials response.

ANSWER 1.2-C Any five of the following: oxygen meters, combustible gas indicators (explosimeters), CO meters, pH meters, radiation detection instruments, calorimetric detector tubes, organic vapor analyzers, photoionization meters, air sampling devices, pH paper or strips, organic vapor badges or film strips, mercury badges, or formaldehyde badges or strips.

EXERCISE 1.2-D Where should decontamination be carried out, if possible?

ANSWER 1.2-D Decontamination should be done in existing facilities, if possible. If facilities do not exist on the site, identify alternate methods or temporary facilities.

EXERCISE 1.2-E What are the primary responsibilities of the rescue team?

ANSWER 1.2-E The primary responsibilities of the rescue team are to provide immediate lifesaving aid and remove victims from dangerous scenes or contaminated areas, remove gross contamination from victims, and transfer the victim to medical personnel.



Competency 1.4 Emergency management personnel shall demonstrate a working level knowledge of protective measures.

1. Supporting Knowledge and Skills

- a. Discuss the types, uses, and limitations of radiological, chemical, and personal protective equipment.
- b. Describe the implementation and process of decontamination operations in a radiological and chemical environment.
- c. Discuss the concepts of sheltering, evacuation, and relocation.
- d. Discuss the role of Protective Action Guides, Emergency Response Planning Guides, and pollution standards in emergency planning and response.

2. Self-Study Activities (corresponding to the intent of the above competency)

NOTE: • Below are two web sites containing many of the references you may need.

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Read 29 CFR 1910.120, Appendix B, “General Description and Discussion of the Levels of Protection and Protective Gear,” pages 403 through 405.

Read 29 CFR 1910.132, “General Requirements,” pages 410 through 411.

EXERCISE 1.4-A Discuss the levels of protection afforded by PPE.



EXERCISE 1.4-B What are the minimum training requirements for employees required to use PPE?

Read NFPA 471, "Recommended Practice for Responding to Hazardous Material Incidents," Chapter 7, Decontamination, Items 7-1 through 7-3.7.

EXERCISE 1.4-C What is the "conservative" approach to take on implementation of decontamination processes?

Read the *DOE Radiological Control Manual*, Chapter 4, Item 463, Decontamination.

EXERCISE 1.4-D Who "should" be responsible for directing decontamination efforts for a radioactively contaminated area?

EXERCISE 1.4-E What are the preferred agents for decontamination?

Read the Emergency Management Guide, *Interim Guidance for Protective Actions*, June 1, 1993, Section C.4, "Evacuation and Sheltering of Workers," pages 10 through 11.

Read the Emergency Management Guide, *Interim Guidance for Protective Actions*, June 1, 1993, Section C.8.f, "Relocation," page 15.

EXERCISE 1.4-F Sheltering should be used instead of evacuation under what circumstances?

Read DOE Order 5500.1B, *Emergency Management System*, Attachment 2, Definitions.

EXERCISE 1.4-G Discuss the role of Protective Action Guides, Emergency Response Planning Guides, and pollution standards in emergency planning and response.



3. Summary

Protective measures should be implemented as soon as possible after an emergency has been declared. A properly prepared and trained team should be ready to go into action immediately. An understanding of the concepts of sheltering, evacuation, and relocation will help determine the necessary actions to take. Knowing the role of the Protective Action Guides, the Emergency Response Planning Guides, and the pollution standards for the facility/area will help determine how the emergency is approached, as well as what protective equipment is necessary. Once the emergency is contained, the process of decontamination can begin.

4. Exercise Solutions

EXERCISE 1.4-A Discuss the levels of protection afforded by PPE.

ANSWER 1.4-A Level A - Provides the greatest level of protection to the skin, respiratory system, and eyes.

Level B - Provides the highest level of respiratory protection, but a lesser degree of skin protection.

Level C - The concentration(s) and types of airborne substance(s) is known, and the criteria for using air-purifying respirators are met.

Level D - A work uniform affording minimal protection, used for nuisance contamination only.

EXERCISE 1.4-B What are the minimum training requirements for employees required to use PPE?

ANSWER 1.4-B Each employee required to wear PPE shall be trained to know at least the following:

1. When PPE is necessary
2. What PPE is necessary
3. How to don, doff, adjust, and wear the PPE
4. The limitations of the PPE
5. The proper care, maintenance, useful life, and disposal of the PPE



EXERCISE 1.4-C What is the “conservative” approach to take on implementation of decontamination processes?

ANSWER 1.4-C The conservative action is always to assume that contamination has occurred and to implement a thorough, technically sound decontamination procedure until it is determined or judged to be unnecessary.

EXERCISE 1.4-D Who “should” be responsible for directing decontamination efforts for a radioactively contaminated area?

ANSWER 1.4-D Facility line management should be responsible for directing decontamination efforts.

EXERCISE 1.4-E What are the preferred agents for decontamination?

ANSWER 1.4-E Water and steam are the preferred decontamination agents.

EXERCISE 1.4-F Sheltering should be used instead of evacuation under what circumstances?

ANSWER 1.4-F Sheltering may be the appropriate action when the following conditions exist:

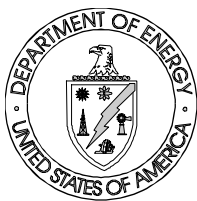
1. The net benefit is greater than that associated with evacuation.
2. It places the workers in a position where additional instructions can be rapidly disseminated.
3. Rapid evacuation is impeded.
4. Plume arrival is imminent.

EXERCISE 1.4-G Discuss the role of Protective Action Guides, Emergency Response Planning Guides, and pollution standards in emergency planning and response.



ANSWER 1.4-G

When planning for an emergency and the appropriate response, the Emergency Response Planning Guides will tell you the maximum dosages or levels of hazardous chemicals exposures that, when exceeded by a short-term or acute exposure (up to 1 hour), will cause irreversible or serious health effects in humans. Protective Action Guides are levels or ranges of radiation exposure above which protective action should be taken. These values should reflect a balance of risks and costs to personnel, the public, and the environment (pollution standards) weighed against the benefits obtained from the actions.



Competency 1.5 Emergency management personnel shall demonstrate a working level knowledge of external agency response to an emergency.

1. Supporting Knowledge and Skills

- a. Discuss the concept of Emergency Public Information and the role between the Public and Joint Information Center in disseminating information in an emergency.
- b. Discuss the use and implementation of Memoranda of Agreement/Understanding with off-site agencies.
- c. Discuss the role of the Protective Force in response to an emergency.
- d. Discuss the use of Agreements in Principle and the effect on emergency planning and response.
- e. Discuss the medical needs in response to an emergency.

2. Self-Study Activities (corresponding to the intent of the above competency)

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:
gopher://VM1.HQADMIN.DOE.GOV:70/00/doemenu1/directiv/251cross.asc
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Section 1.0

Read the DOE policy and concept of emergency operations (pages 2 through 7), responsibilities of the heads of field elements (pages 22 through 27), and the definitions in Attachment 2 of DOE Order 5500.1B, *Emergency Management System*.

- EXERCISE 1.5-A Referring to DOE Order 5500.1B, identify the appropriate statements (or paragraphs) in the DOE policy that address external and/or off-site agencies. What type of support does DOE provide to and expect from these external agencies?
- EXERCISE 1.5-B In the context of DOE's concept of operations for the Emergency Management System (EMS), describe the three major provisions of the EMS.
- EXERCISE 1.5-C What is the primary responsibility of the head of the field element?
- EXERCISE 1.5-D Within the section on responsibilities and authorities of the head of the field element in DOE Order 5500.1B, highlight those paragraphs which address external agencies.

Read the DOE Emergency Management Guide *Interim Guidance on Offsite Response Interfaces*, pages 1 through 5.

- EXERCISE 1.5-E Generally, what are the external agencies that the DOE facility or site must interface with?
- EXERCISE 1.5-F List examples of the emergency management (EM) support provided by off-site or external agencies/organizations to DOE facilities.
- EXERCISE 1.5-G List examples of the EM response support provided to off-site or external agencies/organizations by DOE facilities.
- EXERCISE 1.5-H Name the typical agreements established between DOE facilities and external or off-site agencies/organizations.
- EXERCISE 1.5-I What types of facilities, equipment, and supplies should on-site medical decontamination and treatment centers maintain?
- EXERCISE 1.5-J What is the purpose of the agreements established between DOE facilities and external or off-site agencies/organizations?



3. Summary

Review the DOE Emergency Management Guide *Interim Guidance on Offsite Response Interfaces*, pages 1 through 5.

Review Attachment 2 of DOE Order 5500.1B, *Emergency Management System*.

4. Exercise Solutions

EXERCISE 1.5-A Identify the appropriate statements (or paragraphs) in the DOE policy that address external and/or off-site agencies. What type of support do DOE contractors provide to and expect from these external agencies?

ANSWER 1.5-A DOE Order 5500.1B, *Emergency Management*, paragraph 8.b(1) and (2).

DOE contractors supply support to external and/or off-site agencies in the form of implementing procedures, integrated training programs, drills, exercises, and some procurement and maintenance of resources.

DOE expects these external agencies to maintain consistency in overall preparedness and response.

EXERCISE 1.5-B In the context of DOE's concept of operations for the EMS, describe the three major provisions of the EMS.

ANSWER 1.5-B

1. The development, coordination, etc., of emergency plans and procedures
2. Ensuring the readiness of all DOE capabilities in responding to operational, energy, and continuity of government (COG) emergencies
3. The management, coordination, and direction of responses to emergencies

EXERCISE 1.5-C What is the primary responsibility of the head of the field element?

ANSWER 1.5-C To establish and maintain an effective, integrated emergency preparedness program.



EXERCISE 1.5-D Within the section on responsibilities and authorities of the head of the field element in DOE Order 5500.1B, highlight those paragraphs which address external agencies.

ANSWER 1.5-D

- w(6)
- w(10)(c) and (d)
- w(11)(a) and (b)
- w(13)
- w(18)
- w(26)(a)3 and 4
- w(26)(b)

EXERCISE 1.5-E Generally, what are the external agencies that the DOE facility or site must interface with?

ANSWER 1.5-E Other federal, state, tribal, local, and other significant entities within the vicinity of the emergency planning zone (EPZ).

EXERCISE 1.5-F List examples of the EM support services provided by off-site or external agencies/organizations to DOE facilities.

ANSWER 1.5-F Hospitals, fire departments, ambulances, and coroners.

EXERCISE 1.5-G List examples of the EM response support provided to off-site or external agencies/organizations by DOE facilities.

ANSWER 1.5-G Radiological incident assistance, monitoring, detection, and assessment. Based on Memorandums of Agreement (MOAs) and Memorandums of Understanding (MOUs) DOE facilities may provide specific emergency response capabilities, i.e. HAZMAT, to offsite entities such as local governments. DOE also has National response assets (NEST, ARG, ARAC, FERMAC) which can be provided to offsite agencies if needed.



EXERCISE 1.5-H Name the typical agreements established between DOE facilities and external or off-site agencies/organizations.

ANSWER 1.5-H Mutual aid, memoranda of understanding, memoranda of agreement, agreements in principle, and state oversight agreements.

EXERCISE 1.5-I What types of facilities, equipment, and supplies should on-site medical decontamination and treatment centers maintain?

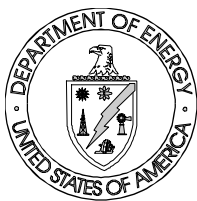
ANSWER 1.5-I

1. Designated contaminated personnel entrance
2. Contamination removal area
3. Showers with used water collection ability
4. Radiation survey instruments and decontamination supplies
5. Separate showers and change rooms for medical and health physics personnel
6. Chelation therapy treatment capability
7. Chemical burn treatments and antidotes
8. Personal protective equipment such as gloves, hoods, goggles, etc.
9. Bandages and other medical supplies

EXERCISE 1.5-J What is the purpose of the agreements established between DOE facilities and external or off-site agencies/organizations?

ANSWER 1.5-J

1. Provide prearranged support of alternative resources
2. Expedite emergency operations, maximize response and recovery efforts, and simplify liability and reimbursement issues
3. Acquire or arrange emergency services through providers, vendors, etc.



Competency 1.6 Emergency Management personnel shall demonstrate a working level knowledge of the concepts associated with environmental protection, transport and diffusion.

1. Supporting Knowledge and Skills

- a. Discuss windspeed, wind direction, and stability as related to emergency assessment and response.
- b. Describe the concepts of concentration and deposition and their relationship to emergency planning and response.
- c. Define the terms ground water, surface water, and aquifer and discuss transport and diffusion in these media in the context of emergency planning and response.
- d. Discuss the concepts of ecosystem and habitat in the context of environmental protection as part of emergency planning and response.
- e. Describe the role of consequence assessment process, including the use of modeling techniques and computer codes and the integration of monitoring information.

2. Self-Study Activities (corresponding to the intent of the above competency)

- NOTES:
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Read paragraph 11.c(5), pages 10 through 11 of DOE Order 5500.3A.



Read pages 1 through 14 of the DOE Emergency Management Guide *Guidance for Consequence Assessment*.

- EXERCISE 1.6-A Define consequence assessment.
- EXERCISE 1.6-B Why are meteorological conditions monitored near DOE facilities?
- EXERCISE 1.6-C What other environmental conditions are important to consequence assessment?
- EXERCISE 1.6-D An emergency is declared. What are the steps taken during the consequence assessment process?
- EXERCISE 1.6-E What is meant by continuous consequence assessment? When does it occur?
- EXERCISE 1.6-F In general, by what methods is a timely initial assessment of consequences performed?

3. Summary

Consequence assessment is the evaluation and interpretation of radiological or other hazardous materials measurements, or other information to provide a basis for decision making. DOE Order 5500.3A, paragraph 11.c(5), provides information on provisions required for consequence assessment. The DOE Order states in general terms that provisions must adequately assess actual or potential on-site and off-site consequences of an emergency. Refer to the Emergency Management Guide for further assistance.

4. Exercise Solutions

- EXERCISE 1.6-A Define consequence assessment.
- ANSWER 1.6-A Consequence assessment evaluates and interprets radiological or other hazardous materials measurements or other information to provide a basis for decision making.



EXERCISE 1.6-B Why are meteorological conditions monitored near DOE facilities?

ANSWER 1.6-B Characterization of atmospheric transport and diffusion conditions (e.g., wind speed, wind direction, and stability) in the vicinity of DOE facilities is essential for consequence assessments of airborne releases of hazardous materials. The airborne release pathway typically represents the most time-urgent situation, requiring a rapid, coordinated response.

EXERCISE 1.6-C What other environmental conditions are important to consequence assessment?

ANSWER 1.6-C Aquatic pathways are also monitored.

EXERCISE 1.6-D An emergency is declared. What are the steps taken during the consequence assessment process?

ANSWER 1.6-D

Steps Taken During the Consequence Assessment Process	
Step	Action
---	Following initial classification and emergency declaration . . .
1	The emergency organization, facilities, and resources are activated.
2	The initial consequence assessment is refined by available data reflecting current facility status. (The data quantify actual or potential impacts on people and the environment.)
3	The quantitative results are compared to the emergency actions levels (EALs).
4	The emergency class is revised as appropriate.
5	Appropriate on-site protective actions and off-site recommendations are made.



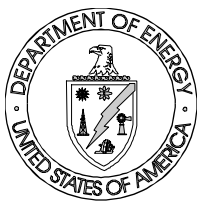
EXERCISE 1.6-E What is meant by continuous consequence assessment? When does it occur?

ANSWER 1.6-E Following a timely initial consequence assessment, additional information on a hazardous release will be received for updating consequence assessment calculations. Resulting continuous consequence assessment activities become an active process, and there is no set time period between iterations. The process is repeated when new or changed information is available.

EXERCISE 1.6-F In general, by what methods is a timely initial assessment of consequences performed?

ANSWER 1.6-F There are several methods:

- Calculational models using automated data on release pathways and environmental transport and diffusion
- Simple calculational models such as graphs, nomograms, or worksheets
- Precalculated consequences for hazards and release magnitudes



Competency 1.7 Emergency Management personnel shall demonstrate a working level knowledge of command and control during an emergency.

1. Supporting Knowledge and Skills

- a. Discuss the concept and define the components of the Incident Command System in the context of on-site and off-site emergency response.
- b. Describe the relationship of incident command to incident mitigation.
- c. Describe the relationship of the Incident Commander to the facility/site emergency response organization.
- d. Describe how the transfer of command should occur from the shift supervisor to the facility/site emergency response organization.
- e. Describe how the transfer of command should occur between shifts at the incident command post and at the emergency operations center(s).
- f. Discuss the training needed for incident commanders and the managers of the emergency response organization.
- g. Describe the relationship and regulatory authority(ies) of the on-site emergency organization to those of local, state, and tribal emergency response organizations.

2. Self-Study Activities (corresponding to the intent of the above competency)

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Read 29 CFR 1910.120, Section (q).

Read the site/facility emergency response plan(s) for your organization.

Read your organization's Incident Command System operations guide or equivalent.

- | | |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EXERCISE 1.7-A | Describe the emergency operations relationship model. |
| EXERCISE 1.7-B | Who is the first individual in charge of an emergency situation? |
| EXERCISE 1.7-C | What is the relationship of incident command to incident mitigation? |
| EXERCISE 1.7-D | Describe the relationship of the Incident Commander to the facility/site emergency response organization. |
| EXERCISE 1.7-E | Describe the relationship and responsibilities of the on-site emergency organization to those of local, state, and tribal emergency response organizations. |

3. Summary

“Emergency management programs provide the final barrier of DOE’s defense-in-depth concept for ensuring the safety and health of workers and the public and for protecting property and the environment in the event of an emergency. Emergency management programs enable organizations to respond to an emergency in a timely, efficient, and effective manner, resulting in improved mitigation of consequences. Emergency management programs are developed and maintained to ensure adequate response for many potential scenarios and to provide the framework for responding to scenarios not specifically considered” DOE Emergency Management Guide, *Introduction*.



4. Exercise Solutions

EXERCISE 1.7-A Describe the emergency operations relationship model.

ANSWER 1.7-A The emergency operations relationship model illustrates the responsibilities of a typical DOE contractor facility emergency response organization. It provides an integrated operational and management structure to meet most functional response requirements and defines the roles and responsibilities of the key personnel.

EXERCISE 1.7-B Who is the first individual in charge of an emergency situation?

ANSWER 1.7-B “The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer” CFR 1910.120 (q)(3)(i).

EXERCISE 1.7-C What is the relationship of incident command to incident mitigation?

ANSWER 1.7-C “Prior experience has demonstrated that effective emergency response depends upon early recognition of indicators which signal the onset of accident events, coupled with the rapid implementation of emergency actions.” DOE Emergency Management Guide *Event Classification and Emergency Action Levels*, Section B.4.d.

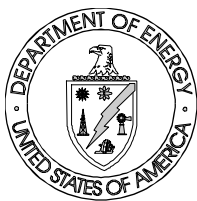
EXERCISE 1.7-D Describe the relationship of the Incident Commander (IC) to the facility/site emergency response organization.

ANSWER 1.7-D This relationship is dictated by the facility emergency response plan. You should be familiar with the plan for your facility. The IC reports to the Emergency Director.



EXERCISE 1.7-E Describe the relationship and responsibilities of the on-site emergency organization to those of local, state, and tribal emergency response organizations.

ANSWER 1.7-E This relationship is dictated by the facility emergency response plan and the local cooperative agreements and memoranda of understanding. You should be familiar with these documents as they apply to your facility.



Competency 1.9 Emergency management personnel shall have a familiarity level knowledge of emergency rescue and treatment.

1. Supporting Knowledge and Skills

- a. Discuss the field treatment and transportation requirements for badly injured personnel.
- b. Discuss the qualifications of those who apply basic and advanced first aid, emergency medical technicians, and paramedics.
- c. Discuss symptoms and field treatment of hypothermia and shock.

2. Self-Study Activities (corresponding to the intent of the above competency)

NOTE: • Below are two web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://cted.inel.gov/cted/index.html	DOE Standards, Guides, and Orders.
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations

Read the DOE Emergency Management Guide *Interim Guidance for Emergency Medical Support*, pages 1 through 4.

- EXERCISE 1.9-A Locate your facility's medical support office and request the following information from the medical support staff:
1. What procedures and policies (local, tribal, state, and Federal) determine their work activities?
 2. To what extent do they support the facility/site's emergency management drills and exercises?
 3. What is their involvement in the emergency rescue and treatment of injured or ill facility/site staff?



4. What off-site medical support facilities do they interface with, and in what way?
5. What are (and in what local, tribal, state and Federal standards) the qualification requirements for the following:
 - Medical staff who perform basic and advanced first aid
 - Emergency medical technicians
 - Paramedics
 - Other on-site medical support staff

EXERCISE 1.9-B Ask your facility's medical support staff to identify the most common medical problem (and its frequency) at the facility/site requiring emergency treatment.

EXERCISE 1.9-C Ask your facility's medical support staff to identify the medical problems (including symptoms and treatment) postulated to occur at the facility/site during emergency events (as identified in the facility safety analysis report).

Read *Advanced First Aid and Emergency Care*, pages 20 through 23, and 254 through 284, American Red Cross, 1979.

EXERCISE 1.9-D While help is being summoned, describe the emergency treatment for serious injuries.

EXERCISE 1.9-E Describe the indications for immediate rescue.

3. Summary

Review the DOE Emergency Management Guide *Interim Guidance for Emergency Medical Support*, pages 1 through 4.



4. Exercise Solutions

- EXERCISE 1.9-A** Locate your facility's medical support office and request the following information from the medical support staff:
1. What procedures and policies (local, tribal, state, and Federal) determine their work activities?
 2. To what extent do they support the facility/site's emergency management drills and exercises?
 3. What is their involvement in the emergency rescue and treatment of injured or ill facility/site staff?
 4. What off-site medical support facilities do they interface with, and in what way?
 5. What are (and in what local, tribal, state, and Federal standards) the qualification requirements for the following:
 - Medical staff who perform basic and advanced first aid
 - Emergency medical technicians
 - Paramedics
 - Other on-site medical support staff

ANSWER 1.9-A The answer is facility- and jurisdiction-specific.

- EXERCISE 1.9-B** Ask your facility's medical support staff to identify the most common medical problem (and its frequency) at the facility/site requiring emergency treatment.

ANSWER 1.9-B The answer is facility-specific.

- EXERCISE 1.9-C** Ask your facility's medical support staff to identify the medical problems (including symptoms and treatment) postulated to occur at the facility/site during emergency events (as identified in the facility safety analysis report).

ANSWER 1.9-C The answer is facility-specific.

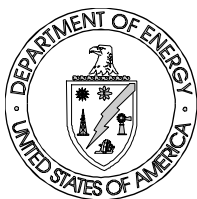


EXERCISE 1.9-D While help is being summoned, describe the emergency treatment for serious injuries.

- ANSWER 1.9-D
1. Determine the need for immediate removal.
 2. Ensure that the victim has an open airway, and give artificial respiration if necessary.
 3. Control severe bleeding.
 4. Check for injuries.
 5. Give first aid for poisoning or ingestion of harmful chemicals (refer to MSDS if possible).

EXERCISE 1.9-E Describe the indications for immediate rescue.

- ANSWER 1.9-E
- Fire or explosion danger
 - Danger of asphyxiation due to lack of oxygen or due to gas
 - Serious traffic hazards
 - Risk of drowning
 - Exposure to cold, intense heat, or intense weather conditions
 - Possibility of injury due to potential for collapsing walls
 - Electrical injury or potential of electrical injury
 - Pinning by machinery



Competency 1.10 Emergency Management personnel shall demonstrate a working knowledge of the integration/interface of the following types of emergency plans:

- Site emergency plans
- Facility emergency plans
- Building emergency plans
- Security emergency plans
- Spill prevention, containment and countermeasure plans
- Fire prevention/suppression plans
- Other worker safety plans
- Local, state, and tribal emergency plans
- Other environmental emergency contingency plans

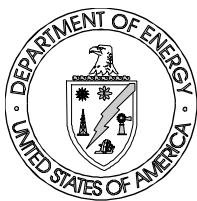
1. Supporting Knowledge and Skills

- a. Describe the typical content and applicability of each of the emergency plans listed above.
- b. Describe the integration/interface of the listed plans.
- c. Describe the roles and responsibilities of the on-site and off-site emergency response organizations identified in the above emergency plans.

2. Self-Study Activities (corresponding to the intent of the above competency)

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:
gopher://VM1.HQADMIN.DOE.GOV:70/00/doemenu1/directiv/251cross.asc
 - Below are two web sites containing many of the references you may need.

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Read DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*, Sections 9.d and e, 10.e, and 11.a and d(1) through (3).

Read the DOE Emergency Management Guide *Standard Format and Content of Emergency Plans*, December 11, 1991.

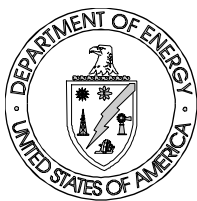
Read the DOE Emergency Management Guide *Interim Guidance on Offsite Response Interfaces*, July 7, 1992.

- EXERCISE 1.10-A State the purpose of a site emergency plan.
- EXERCISE 1.10-B Identify the technical basis of the facility emergency plan.
- EXERCISE 1.10-C Briefly describe the major elements of a site/facility emergency plan.
- EXERCISE 1.10-D Describe the general relationship between site emergency plans and worker safety plans.
- EXERCISE 1.10-E Discuss the relationship of spill prevention plans, fire prevention and suppression plans, and the site emergency plan.
- EXERCISE 1.10-F Describe the mechanism for the interface of local, state, and tribal plans and a site emergency plan for coordinated emergency response.

3. Summary

Read DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*, Section 11.d.1(a through c).

The emergency plan describes the provisions for response to an operational emergency. The plan details the range of potential emergencies; emergency action levels, which trigger emergency response actions; the on-site emergency response organization; and on-site and off-site facilities and equipment available to respond to the specific potential emergencies.



4. Exercise Solutions

EXERCISE 1.10-A State the purpose of a site emergency plan.

ANSWER 1.10-A The purpose of the emergency plan is to describe the entire process designed to respond to and mitigate the potential consequences of an emergency at a DOE site.

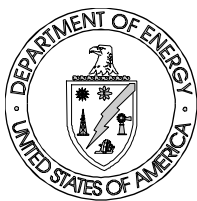
EXERCISE 1.10-B Identify the technical basis for the facility emergency plan.

ANSWER 1.10-B The basis for the facility emergency plan is the facility hazards assessment.

EXERCISE 1.10-C Briefly describe the major elements of a site/facility emergency plan.

ANSWER 1.10-C

Major Elements of an Emergency Plan	
Element	Description
Introduction	Includes a statement of the purpose and scope of the plan, concept of operations, and a description of the site.
Emergency Response Organization	Describes the internal (on-site) emergency response organization, including a description of the organization, direction, and control, and the emergency management operations.
Off-site Response Interface	Describes emergency response available off-site, including other Federal agencies and state, local, and tribal governments, and describes the memoranda of agreement, memoranda of understanding, and agreements in principle for interface with these off-site groups.
Operational Emergency Event Classes	Describes the emergency action levels which trigger an emergency response and activate the emergency plan.
Notification and Communication	Describes necessary notifications and communication of those notifications during an emergency event.



Major Elements of an Emergency Plan	
Element	Description
Consequence Assessment	Describes the determination and calculation of potential consequences.
Protective Actions	Describes emergency planning zones, Protective Action Guides and Emergency Response Planning Guidelines, personnel accountability and communication during an emergency event, and termination and/or shutdown.
Medical Support	Provides information on facilities, equipment, and staff available for medical support to an emergency. This section also describes any agreements for transportation and treatment of the injured by off-site agencies.
Recovery and Reentry	Discusses the termination or downgrade of the emergency, as well as actions necessary for reentry and recovery.
Public Information	Describes facilities, equipment, and mechanisms for coordination of emergency public information.
Emergency Facilities and Equipment	Describes facilities and equipment available for emergency response.
Training	Describes training requirements and available training for on-site and off-site personnel.
Drills and Exercises	Describes the objectives and schedule for drills and exercises for on-site personnel and coordination with off-site agencies.
Emergency Management Program Administration	Identifies the emergency management program administrator, as well as administrative controls for self-assessment.

EXERCISE 1.10-D Describe the general relationship between site emergency plans and worker safety plans.

ANSWER 1.10-D Site emergency plans should be coordinated with worker safety plans to ensure that worker safety is not compromised during any emergency response.

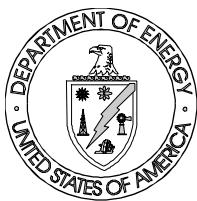


EXERCISE 1.10-E Discuss the relationship of spill prevention plans, fire prevention and suppression plans, and the site emergency plan.

ANSWER 1.10-E Spill prevention plans and fire prevention and suppression plans should be reflected in the facility emergency plan.

EXERCISE 1.10-F Describe the mechanism for the interface of local, state, and tribal plans and a site emergency plan for coordinated response to an emergency.

ANSWER 1.10-F Memoranda of understanding and agreements in principle provide the mechanism for interface of local, state, and tribal emergency plans with DOE site emergency plans. These are formal agreements and should be included in the off-site interface section of the site emergency plan.



Competency 1.11 Emergency Management personnel shall demonstrate a working level knowledge of the relationships of emergency planning, preparedness, response, and post-incident activities.

1. Supporting Knowledge and Skills

- a. Discuss the relationships of emergency planning, preparedness, response, and post-incident activities.
- b. Define recovery and reentry, and describe the typical contents of recovery and reentry plans.
- c. Discuss the roles and responsibilities of the Departmental organizational elements in developing recovery and reentry plans.

2. Self-Study Activities (corresponding to the intent of the above competency)

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:
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Read DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*.

EXERCISE 1.11-A List two activities associated with each of the following:

- Planning
- Preparedness
- Response
- Recovery



EXERCISE 1.11-B Describe how planning and preparedness activities can help to ensure a successful emergency response.

EXERCISE 1.11-C Name the 13 elements required for an emergency management program in DOE.

Read the DOE Emergency Management Guide *Interim Guidance for Reentry and Recovery*.

EXERCISE 1.11-D Differentiate between reentry and recovery by the types of activities associated with each.

EXERCISE 1.11-E Differentiate between reentry and recovery with regard to the timing of the emergency event activities.

EXERCISE 1.11-F Of the contractor, field element, and Headquarters program office, which has primary responsibility for the development of recovery plans?

3. Summary

Emergency management activities are typically categorized as planning, preparedness, and response. A fourth category is recovery from an emergency event.

Planning includes the development and preparation of emergency plans and procedures and the identification of necessary personnel and resources to provide an effective response to an emergency event.

Preparedness includes the training of personnel; acquisition and maintenance of resources; and exercising of the plans, procedures, personnel, and resources essential for emergency response.

Response represents the implementation of planning and preparedness during an emergency and involves the effective decisions, actions, and application of resources that must be accomplished to mitigate consequences and recover from an emergency.

Although reentry and recovery are often spoken of as a single item, they are two separate but related activities, each with its own purpose and implementation concerns.



The DOE Emergency Management Guide defines reentry as “a planned activity to accomplish a specific objective(s) set by the emergency response organization, conducted prior to the termination of emergency response, which involves reentering a facility or affected area that has been evacuated or closed to personnel access during the course of an emergency.”

DOE Order 5500.1B defines recovery as those actions taken after a facility has been brought to a stable or shutdown condition to return the facility to normal. The recovery phase of emergency management continues from the time an operational emergency is declared terminated until the facility and any affected areas meet predetermined criteria for the resumption of normal operation or use.

4. Exercise Solutions

EXERCISE 1.11-A List two activities associated with each of the following:

- Planning
- Preparedness
- Response
- Recovery

ANSWER 1.11-A Any two activities from the following are acceptable:

Activities associated with planning are

- (1) conducting a facility hazards assessment
- (2) determining the facility emergency planning zones
- (3) assessing facility/site response capabilities

Activities associated with preparedness are

- (1) assigning responsibilities and authorities
- (2) acquiring and maintaining resources
- (3) performing drills and exercises

Activities associated with response are, among others

- (1) categorization and notification
- (2) consequences assessment and protective actions
- (3) public information

Activities associated with recovery are

- (1) evaluation of damages
- (2) development of a recovery plan
- (3) consequence assessment and environmental monitoring



EXERCISE 1.11-B Describe how planning and preparedness activities can help to ensure a successful emergency response.

ANSWER 1.11-B Planning includes development and preparation of plans and procedures to ensure an effective emergency response. Preparedness activities ensure that plans and procedures are adequate and valid, equipment and facilities are available for emergency response, and personnel are trained to effectively implement the plans and procedures when responding to an emergency to protect workers, the public, and the environment.

EXERCISE 1.11-C Name the 13 elements required for an emergency management program in the DOE.

ANSWER 1.11-C The 13 elements of an emergency management program include the following:

- Emergency response organization
- Off-site response interfaces
- Operational emergency event classes
- Notifications
- Consequence assessment
- Protective actions
- Medical support
- Recovery and reentry
- Public information
- Emergency facilities and equipment
- Training
- Drills and exercises
- Program administration

EXERCISE 1.11-D Differentiate between reentry and recovery by the types of activities associated with each.

ANSWER 1.11-D Reentry activities include such things as search and rescue, mitigation, and damage control and assessment; recovery activities include damage assessment, environmental consequence assessment, long-term protective action determinations, facility/environmental restoration, and dissemination of information.



EXERCISE 1.11-E Differentiate between reentry and recovery with regard to the timing of the emergency event activities.

ANSWER 1.11-E Reentry activities are “time urgent” and may actually occur during the response phase of an emergency event; recovery activities are usually longer-term activities that occur after the response phase of an emergency has been terminated.

EXERCISE 1.11-F Of the contractor, field element, and Headquarters program office, which has primary responsibility for development of recovery plans?

ANSWER 1.11-F The contractor has primary responsibility for the development of the recovery plan, with concurrence from the field element.